SUMMARY OF LABORATORY ON-SITE INSPECTION FINDINGS

AMRL Soil and Aggregate Program 22nd Tour
(March 1998 to May 2000)

SOIL

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SOIL

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Part I - Percentage of Laboratories in Conformance

Item	Total # of Labs	# of Labs in Conformance	% of Labs in Conformance
GENERAL APPARATUS			
Literature	541	327	60.4
Sample Reducers	521	429	82.3
Sieves	538	347	64.5
Mechanical Shakers	345	345	100.0
General Purpose Balances	541	510	94.3
General Purpose Weights	20	20	100.0

Test Method AASHTO/ASTM	Total # Labs AASHTO	# Labs in Conformance AASHTO	% Labs in Conformance AASHTO	Total # Labs ASTM	# Labs in Conformance ASTM	% Labs in Conformance ASTM
SOIL						
T87/D421	254	223	87.8	264	221	83.7
T88/D422	211	51	24.0	248	51	20.6
T89	281	99	35.2			
T90	282	195	69.1			
D4318				318	70	22.0
T92/D427	25	18	72.0	25	18	72.0
T99/D698	283	63	22.3	315	55	17.5
T100/D854	211	124	58.8	245	116	47.3
T134/D558	45	21	46.7	45	21	46.7
T135/D559	18	5	27.8	19	3	15.8
T136/D560	12	3	25.0	12	1	8.3
T146/D2217	75	61	81.3	100	80	80.0
T176/D2419	174	51	29.3	165	63	38.2
T180/D1557	272	61	22.4	320	52	16.3
T190/D2844	57	8	14.0	56	9	16.1
T193/D1883	108	14	13.0	119	11	9.2
T208/D2166	117	76	65.0	138	85	61.6
T215/D2434	22	7	31.8	30	11	36.7
T216/D2435	115	33	28.7	116	35	30.2
T236/D3080	73	30	41.1	77	19	24.7
T238/	88	64	72.7	108	91	84.3
T239	88	65	73.9	106	86	81.1
T265/D2216	279	188	67.4	314	277	88.2
T296/D2850	70	41	58.6	76	46	60.5
T297/D4767	61	30	49.2	70	37	52.9
D1140				248	175	70.6
D2487				94	92	97.9
D2488				73	72	98.6
D5084				84	57	67.9

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Part II - Description of Footnotes

GENERAL APPARATUS

Description of Footnote	# of Labs
LITERATURE	
Current AASHTO or ASTM publications not available.	219
SAMPLE REDUCERS (T248/C702)	
Solder joints cracked and/or dividers separated.	6
Feeder pan width not equal to or slightly less that total chute width.	30
Feeder pan not presented.	50
Chute width not ½ to 3/4 in. for fine aggregate.	1
Chutes deformed and/or not of equal width.	4
Splitter did not have 12 or more chutes for splitting fine aggregate.	0
Hopper doors bent, would not close.	4
Discharge pan width smaller than total chute width.	0
Gap in the hopper.	1
Feeder pan did not have straight edge.	1
Discharge pans not presented.	1
Dividers were separated.	1
SIEVES (M92/E11)	
Sieve cloth/mesh in unsatisfactory condition.	165
Broken solder joint between sieve frame and mesh.	21
Sieve pan had holes/cracks.	23
Cloth or mesh separated from edge of frame.	9
Openings in cloth/mesh larger or smaller that specified.	22
Sieve not a USA standard sieve.	0
Sieve did not have a label.	6
Portion of sieve mesh clogged.	11
Bolts in sieve frame were missing.	3

Description of Footnote	# of Labs
BALANCES (M231/D4753)	
Balance did not meet accuracy requirements.	34
Balance failed off-center loading requirements.	1
Digital readout would not stabilize.	2
Masses used with balance did not meet requirements.	0
Balance did not meet sensitivity requirements.	0
Readout did not return to zero after mass was removed.	1
Support leg on balance was broken.	0
Counterweight dial was not accurate.	0

The tables in the following pages contain information on:
•The percentage of each footnote with respect to the total footnotes written for a particular test method.
•The total number of footnotes written for a particular test method.
•The percentage of the total number of footnotes written for a particular test method with respect to the total number of footnotes written for all of the test methods.

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
DRY PREPARATION OF SOIL (T87/D421)				
Feeder pan width not equal to or slightly less than total chute width.	0	NA	0	NA
Pulverizing device not rubber-covered.	10	27.0	9	15.3
Riffle sampler or sample splitter not presented.	0	NA	0	NA
Representative sample not obtained by splitting or quartering.	6	16.2	7	11.9
Sample not pulverized with mortar and pestle (other means used).	3	8.1	4	6.8
Representative sample for hydrometer and specific gravity not obtained by splitting or quartering.	0	NA	0	NA
Initial sample not quartered properly.	0	NA	0	NA
After separation on sieves, material retained on sieves not pulverized and resieved.	5	13.5	3	5.1
Sample not dried at temperature less than 60ºC.	3	8.1	7	11.9
Sample not separated on No. 4 and No. 10, or No. 10, sieves (No. 4 only used).	3	8.1	3	5.1
Sample not air-dried (oven-dried at 60ºC).	0	NA	4	6.8
Sample not separated on No.10 sieve, +No. 10 material not washed, dried and weighed	0	NA	10	16.9
+No. 10 material not washed, dried and weighed.	3	8.1	6	10.2
Complete set of sieves not presented.	2	5.4	2	3.4
A mortar and pestle was not presented.	1	2.7	3	5.1
Total sample uncorrected for hygroscopic moisture.	1	2.7	1	1.7
Total number of footnotes for test	37		59	
Percentage of the total number footnotes (AASHTO or ASTM)	1.1		1.4	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
PARTICLE SIZE ANALYSIS OF SOILS (T88/D422)				
Oven did not maintain temperature of 110°C.	3	0.6	6	1.2
Dispersion cup baffle rods missing or broken.	20	4.0	30	6.2
Stirring paddles on dispersion device worn or did not conform to specified designs.	28	5.6	38	7.9
Thermometer did not have specified readability.	22	4.4	38	7.9
Thermometer not calibrated.	35	7.0		
Hydrometer did not have specified dimensions.	17	3.4	17	3.5
Hydrometer did not read 0.0 in 20°C distilled water.	2	0.4	4	0.8
Glass rod not presented.	37	7.4		
250-mL beaker not presented.	30	6.0	50	10.4
Balance not readable to 0.01 g.	0	NA	1	0.2
Moisture content containers did not have close-fitting lids.	5	1.0	1	0.2
Dispersion device not presented.	1	0.2	1	0.2
Distilled water not presented.	0	NA	0	NA
Complete sieve set not presented.	25	5.0	38	7.9
Preparation date not marked on bottle of dispersing agent.	26	5.2	34	7.0
Dispersing agent more than 1 month old, pH not adjusted to 8 or 9	6	1.2	8	1.7
Dispersing agent not sodium hexametaphosphate (Calgon presented).	3	0.6	8	1.7
Hydrometer not spun in graduate of clean water.	8	1.6	16	3.3
Set of hydrometer composite corrections not presented.	16	3.2	24	5.0
Specimen not covered with 125 mL of dispersing agent (other amounts used).	3	0.6	5	1.0
Specimen mixture not stirred.	8	1.6	10	2.1
Specimen mixture not stirred with glass rod (other device used).	5	1.0	2	0.4
Specimen not air-dried (oven-dried at 60°C).	5	1.0	10	2.1
After hand shaking, cylinder contents not allowed to thermally equilibrate.	1	0.2	0	NA
After hand shaking, material clinging on sides of cylinder rinsed with water.	2	0.4	16	3.3
Hydrometer not read to nearest ½ division (read to whole division).	6	1.2	1	0.2
Specimen not rinsed thoroughly from dispersion cup.	1	0.2	1	0.2
Hydrometer not placed in cylinder 20-30 seconds before reading.	9	1.8	15	3.1
Cylinder not hand-shaken for 1 minute.	3	0.6	5	1.0
After final reading, specimen not washed over No. 200 sieve (No. 40 and No. 200 sieves used).	7	1.4	3	0.6

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
After No. 200 wash, material not resieved on No. 200 sieve.	1	0.2	0	NA
Sample not -No. 10 material (-No. 40 material used).	3	0.6	2	0.4
Cylinder not filled to 1000 mL prior to hand shaking.	2	0.4	5	1.0
Sieve analysis not performed.	2	0.4	1	0.2
Incorrect specimen mass.	6	1.2	12	2.5
Material leaked from cylinder during hand shaking.	5	1.0	8	1.7
Specimen not dispersed for 60 seconds.	12	2.4	17	3.5
Mechanically dispersed specimen mixture not transferred to empty cylinder.	1	0.2	1	0.2
Specimen mixture not mechanically dispersed.	2	0.4	4	0.8
Specimen not soaked in 250-mL beaker.	19	3.8	32	6.6
Hygroscopic moisture specimen not weighed to 0.01 g.	3	0.6	7	1.4
Required hydrometer readings not taken.	10	2.0	11	2.3
Temperature of cylinder contents not recorded after each hydrometer reading.	22	4.4	36	7.5
Correct hand-agitation technique not used.	2	0.4	0	NA
Hygroscopic moisture not determined.	8	1.6	12	2.5
Incorrect hygroscopic moisture specimen mass.	0	NA	6	1.2
Dispersion cup not filled more than half full	11	2.2	13	2.7
Cylinder and contents not turned upside down 60 times in 60 seconds	38	7.6	45	9.3
Final sieve analysis not performed or not correctly.	7	1.4	5	1.0
After No. 200 wash, some +No. 200 material not returned to container.	1	0.2	0	NA
Timing device with a second hand was not presented.	0	NA	1	0.2
Balance not readable to 0.01 g or 0.1%.	0	NA	2	0.4
Reading not taken at the top of the meniscus.	5	1.0	6	1.2
Calculations done incorrectly.	3	0.6	2	0.4
Water bath of constant temperature room not presented.	1	0.2	2	0.4
Incorrect sample preparation.	1	0.2	1	0.2
Dipsersing agent was not mixed at 40 g/Liter.	1	0.2	1	0.2
Specimen was not soaked for 12 - 16 hours.	0	NA	1	0.2
Procedure not demostrated.	1	0.2	0	NA
Water bath or constant temperature room not presented.	0	NA	1	0.2
Total number of footnotes per test	501		483	
Percentage of the total number footnotes (AASHTO or ASTM)	14.7		11.4	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
LIQUID LIMIT OF SOILS (T89)				
Porcelain dish (or other mixing dish) not presented or did not meet specifications.	5	1.4		
Spatula not presented or did not meet specifications.	7	1.9		
Grooving tool did not meet specifications.	63	17.1		
Moisture content containers did not have lids or did not have close-fitting lids.	10	2.7		
Brass dish did not meet specifications.	14	3.8		
Wear spots on base and/or cup too large.	11	3.0		
Feet on liquid limit device worn.	3	0.8		
Drop height of cup not checked.	20	5.4		
Moisture content specimens not dried in 110ºC oven.	3	0.8		
Two groove closures not observed during one-point method.	21	5.7		
Crank not turned at rate of 2 revolutions/second.	8	2.2		
Moisture content specimen not taken as specified.	23	6.3		
Soil remaining in brass cup not removed between trials.	2	0.5		
Range of less than 10 blows between first and third points accepted.	5	1.4		
More than last stroke of grooving tool scraped dish.	0	NA		
Flow curve not plotted as specified.	0	NA		
Incorrect sample mass.	5	1.4		
Brass cup and grooving tool not cleaned after each trial.	2	0.5		
Dry material added once testing had begun.	1	0.3		
Base of liquid limit device held with hand while turning crank.	36	9.8		
Thickness of soil in brass cup greater or less than 10 mm.	3	0.8		
Improper sample preparation.	6	1.6		
Groove closure greater or less than ½ in.	0	NA		
Moisture content specimen taken before 2 groove closures observed during one-point method.	9	2.4		
Improper blow counts accepted.	21	5.7		
Tearing and slippage of soil cake not avoided.	0	NA		
Liquid limit calculated incorrectly.	1	0.3		
Excess soil not returned to mixing dish.	1	0.3		

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Unused soil in storage dish not covered during liquid limit testing.	61	16.6		
Groove in pat not made completely through to the brass cup.	0	NA		
Oven did not maintain temperature of 110ºC.	6	1.6		
Balance not readable to 0.01 g.	11	3.0		
Distilled water not used or not presented.	2	0.5		
Rubber covered pestle not presented.	1	0.3		
Cam and follower were worn.	7	1.9		
Total number of footnotes for test	368			
Percentage of the total number footnotes (AASHTO or ASTM)	10.8			

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
PLASTIC LIMIT OF SOILS (T90)				
Porcelain dish (or other mixing dish) not presented or did not meet specifications.	3	2.9		
Spatula not presented or did not meet specifications.	5	4.8		
Moisture content containers did not have lids or did not have close-fitting lids.	7	6.7		
Glass plate did not meet specifications.	12	11.5		
Moisture content specimens not dried in 110ºC oven.	1	1.0		
Plastic limit reached incorrectly.	20	19.2		
Dry material added once testing had begun.	0	NA		
Plastic limit calculated incorrectly.	5	4.8		
Incorrect sample mass.	26	25.0		
Plastic limit reported incorrectly.	1	1.0		
Oven did not maintain temperature of 110ºC.	6	5.8		
Balance not readable to 0.01 g.	8	7.7		
Specimen not tested in 1.5 to 2.0 g portions.	10	9.6		
Total number of footnotes for test	104			
Percentage of the total number footnotes (AASHTO or ASTM)	3.0			

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
LIQUID LIMIT AND PLASTIC LIMIT OF SOILS (D4318)				
Porcelain dish (or other mixing dish) not presented or did not meet specifications.			9	1.3
Base rebound on liquid limit device not 80-90%.			4	0.6
Brass dish did not meet specifications.			18	2.6
Grooving tool did not meet specifications.			59	8.5
Moisture content containers did not have lids or did not have close-fitting lids.			21	3.0
Glass plate not presented or did not meet specifications.			32	4.6
Wear spots on base and/or cup too large.			33	4.7
Base on liquid limit device did not meet specifications.			12	1.7
Balance readable to 0.01g not presented or not used.			10	1.4
Wash pan not presented or did not meet specifications.			1	0.1
Distilled water not presented or not used.			2	0.3
Feet on liquid limit device did not meet specifications.			2	0.3
Rubber-covered pestle not presented.			3	0.4
Drop height of cup not checked.			24	3.4
Unused soil in storage dish not covered during liquid limit testing.			147	21.1
Crank not turned at 2 revolutions/second.			15	2.2
Liquid limit moisture content specimens not taken as specified.			33	4.7
Two groove closures not observed during liquid limit one-point method.			23	3.3
Soil not reformed in dish after removing first moisture content specimen (one-point method).			15	2.2
Liquid limit groove closure greater or less than ½ in.			0	NA
Improper sample preparation.			43	6.2
Groove formed improperly.			3	0.4
Incorrect sample mass.			36	5.2
Plastic limit reached incorrectly.			41	5.9
Dry material added once testing had begun.			5	0.7
Brass cup and grooving tool not cleaned after each trial.			3	0.4
Improper blow counts accepted.			21	3.0
Tearing and slippage of soil cake not avoided.			2	0.3

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Plastic limit calculated incorrectly.			35	5.0
Liquid limit calculated incorrectly.			6	0.9
Thickness of soil in brass cup greater or less than 10 mm.			2	0.3
Moisture content specimens not dried in 110ºC oven.			1	0.1
Oven did not maintain temperature of 110ºC.			7	1.0
Specimen not covered for 16 hours prior to testing.			11	1.6
Spatula presented did not conform to specifications.			7	1.0
Complete set of sieves not presented.			1	0.1
Cam and follower were worn.			5	0.7
Specimen not tested in 1.5 to 2.0 g portions.			5	0.7
Total number of footnotes for test			697	
Percentage of the total number footnotes (AASHTO or ASTM)			16.4	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
SHRINKAGE FACTORS OF SOILS (T92/D427)				
25-mL glass graduate not presented or did not meet specifications.	2	16.7	2	11.1
Steel straightedge not presented.	0	NA	1	5.6
Metal prongs on glass plate did not meet specifications.	0	NA	0	NA
Glass cup did not meet specifications.	0	NA	0	NA
Milk dish not tapped on cushioned surface.	3	25.0	2	11.1
Lineal shrinkage and/or volumetric change not determined.	0	NA	0	NA
Milk dish not filled in 3 equal layers.	1	8.3	1	5.6
Glass cup not filled to overflowing with mercury.	0	NA	0	NA
Volume of mercury displaced in evaporating dish not determined.	1	8.3	2	11.1
Porcelain evaporating dish did not conform to specifications.	1	8.3	2	11.1
Pan to contain mercury spills did not conform to specifications or was not presented.	0	NA	3	16.7
Milk dish was not greased.	1	8.3	1	5.6
Soil pat was not air dried.	1	8.3	1	5.6
Balance not readable to 0.01 g	1	8.3	1	5.6
Glass plate not presented or did not meet specifications.	1	8.3	2	11.1
Total number of footnotes for test	12		18	
Percentage of the total number footnotes (AASHTO or ASTM)	0.4		0.4	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
MOISTURE-DENSITY OF SOIL (T99/D698)				
Hand rammer did not meet specifications.	55	10.6	88	13.1
Mechanical rammer did not meet specifications.	7	1.3	9	1.3
Sector-face rammer did not meet specifications.	16	3.1	9	1.3
Mechanical rammer not calibrated.	11	2.1	13	1.9
Mold did not meet specifications.	113	21.7	48	7.2
Mold not calibrated.	3	0.6	7	1.0
Straightedge did not meet specifications.	59	11.3	99	14.8
2 in., 3/4 in. and/or 3/8 in. sieves not presented.	14	2.7	1	0.1
Sample extruder not presented or not working properly.	20	3.8	1	0.1
Compaction base not 200-lb concrete block.	2	0.4	1	0.1
Moisture content containers did not have close-fitting lids.	17	3.3	1	0.1
Balance readable to 1 g not presented.	1	0.2	5	0.7
Oven did not maintain temperature of 110ºC.	5	1.0	9	1.3
Sample not dried at temperature of 60ºC or less.	2	0.4	1	0.1
Proper soil size (3/4 in., 3/8 in., No. 4) not used.	0	NA	0	NA
Incorrect sample mass.	1	0.2	2	0.3
Soil layers not lightly tamped with rammer or 2-in. diameter cylinder.	79	15.2	112	16.7
Soil on mold walls not trimmed.	13	2.5	30	4.5
Material compacted incorrectly.	17	3.3	17	2.5
Compacted sample exceeded 1/4 in. over top of mold.	0	NA	16	2.4
Compacted sample not trimmed with straightedge.	2	0.4	2	0.3
Soil not trimmed even with top and/or bottom of mold, holes not patched.	1	0.2	16	2.4
Mass of mold and contents not determined to nearest 1 g.	6	1.2	16	2.4
Sample not extruded with sample extruder.	3	0.6	0	NA
Moisture content specimens taken incorrectly.	43	8.3	57	8.5
Incorrect moisture content specimen mass.	5	1.0	37	5.5
Moisture content not determined according to T265.	16	3.1	18	2.7
100% saturation curve not plotted.	2	0.4	26	3.9
New material not used for each point.	0	NA	5	0.7

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Water filled volume not used in the calculations.	0	NA	12	1.8
Layers were scarified.	4	0.8	6	0.9
Samples not allowed to stand in accordance with Table xxxxx.	1	0.2	5	0.7
Split wall mold not compared	2	0.4	0	NA
At least four samples were not tested.	0	NA	1	0.1
Total number of footnotes for test	520		670	
Percentage of the total number footnotes (AASHTO or ASTM)	15.2		15.8	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
MOISTURE-DENSITY OF SOIL (T180/D1557)				
Hand rammer did not meet specifications.	62	12.2	96	14.2
Mechanical rammer did not meet specifications.	6	1.2	12	1.8
Sector-face rammer did not meet specifications.	19	3.7	12	1.8
Mechanical rammer not calibrated.	13	2.5	12	1.8
Mold did not meet specifications.	110	21.6	47	7.0
Mold not calibrated.	3	0.6	8	1.2
Straightedge did not meet specifications.	58	11.4	99	14.6
2 in., 3/4 in. and/or 3/8 in. sieves not presented.	13	2.5	1	0.1
Sample extruder not presented or not working properly.	19	3.7	1	0.1
Compaction base not 200-lb concrete block.	2	0.4	1	0.1
Moisture content containers did not have close-fitting lids.	17	3.3	0	NA
Balance readable to 1 g not presented.	0	NA	6	0.9
Oven did not maintain temperature of 110ºC.	5	1.0	7	1.0
Sample not dried at temperature of 60ºC or less.	2	0.4	1	0.1
Proper soil size (3/4 in., 3/8 in., No. 4) not used.	0	NA	0	NA
Incorrect sample mass.	2	0.4	3	0.4
Soil layers not lightly tamped with rammer or 2-in. diameter cylinder.	69	13.5	108	16.0
Soil on mold walls not trimmed.	12	2.4	28	4.1
Material compacted incorrectly.	15	2.9	17	2.5

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Compacted sample exceeded 1/4 in. over top of mold.	0	NA	15	2.2
Compacted sample not trimmed with straightedge.	2	0.4	3	0.4
Soil not trimmed even with top and/or bottom of mold, holes not patched.	1	0.2	15	2.2
Mass of mold and contents not determined to nearest 1 g.	6	1.2	17	2.5
Sample not extruded with sample extruder.	3	0.6	0	NA
Moisture content specimens taken incorrectly.	56	11.0	74	10.9
Incorrect moisture content specimen mass.	5	1.0	38	5.6
100% saturation curve not plotted.	2	0.4	24	3.6
New material not used for each point.	0	NA	5	0.7
Water filled volume not used in calculations.	0	NA	15	2.2
Layers scarified.	4	0.8	5	0.7
Samples not allowed to stand in accordance with Table xxxxx.	1	0.2	4	0.6
Split wall mold not compared.	2	0.4	0	NA
Al least four specimens not tested.	1	0.2	2	0.3
Total number of footnotes for test	510		676	
Percentage of the total number footnotes (AASHTO or ASTM)	14.9		15.9	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
SPECIFIC GRAVITY OF SOILS (T100/D854)				
Thermometer readable to 0.5ºC not presented.	12	9.7	30	13.0
Vacuum pressure not less than 100 mm Hg.	3	2.4	3	1.3
Balance readable to 0.01 g not presented.	16	12.9	0	NA
Balance readable to 0.1% not presented.	0	NA	9	3.9
Desiccator not presented.	0	NA	33	14.3
Desiccator did not contain desiccant.	0	NA	7	3.0
Distilled water not used.	2	1.6	6	2.6
Specimen not -No. 10 material for specific gravity in conjunction with T88/D422.	2	1.6	2	0.9
Incorrect specimen mass.	3	2.4	2	0.9
Clay specimen not dispersed using T88/D422 equipment.	1	0.8	1	0.4
Specimen not oven-dried.	5	4.0	3	1.3
Specimen not cooled in desiccator.	1	0.8	14	6.1
Specimen not weighed after placing in pycnometer.	4	3.2	18	7.8
Masses not determined to nearest 0.01 g or 0.1%.	19	15.3	14	6.1
Specimen not soaked at least 12 hours.	10	8.1	14	6.1
Specimen not soaked in pycnometer.	0	NA	1	0.4
Pycnometer not calibrated for series of temperatures.	23	18.5	29	12.6
Pycnometer not calibrated with distilled water.	1	0.8	2	0.9
Pycnometer not filled to maximum of 3/4 full.	2	1.6	2	0.9
Pycnometer not filled to slightly above specimen.	0	NA	6	2.6
Contents of pycnometer not boiled or vacuumed to remove air.	1	0.8	0	NA
Pycnometer not occasionally agitated during boiling.	3	2.4	4	1.7
Pycnometer contents not allowed to cool to room temperature.	0	NA	1	0.4
Pycnometer not filled to calibrated capacity.	0	NA	3	1.3
Temperature of pycnometer and contents not measured.	3	2.4	5	2.2
Mass of pycnometer/water not determined at same temperature as pycnometer/water/soil.	2	1.6	3	1.3
Oven-dry mass of clay soil not determined after testing.	0	NA	0	NA
Specific gravity calculated incorrectly.	1	0.8	3	1.3

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Specific gravity not reported at 20ºC.	5	4.0	6	2.6
Oven did not maintain temperature of 110ºC.	5	4.0	7	3.0
Volume of pycnometer not more than 50% greater than specimen volume.	0	NA	1	0.4
Vacuum not applied for a minimum of 30 minutes.	0	NA	1	0.4
Water not added slowly to avoid entrapment of air bubbles.	0	NA	1	0.4
Total number of footnotes for test	124		231	
Percentage of the total number footnotes (AASHTO or ASTM)	3.6		5.4	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
MOISTURE-DENSITY OF SOIL-CEMENT MIXTURES (T134/ D558)				
Mold did not meet specifications.	9	20.5	4	9.8
Hand rammer did not meet specifications.	7	15.9	7	17.1
Sector face rammer did not meet specifications.	1	2.3	1	2.4
Mechanical rammer not calibrated.	0	NA	0	NA
Straightedge not presented.	1	2.3	3	7.3
Straightedge did not meet specifications.	4	9.1	5	12.2
Oven did not maintain temperature of 110ºC.	4	9.1	4	9.8
Butcher knife not presented.	2	4.5	2	4.9
Procedure not demonstrated.	0	NA	0	NA
Sample not separated on No. 4 sieve.	0	NA	0	NA
Material compacted improperly.	1	2.3	1	2.4
Soil not trimmed even with top of mold.	0	NA	0	NA
Moisture specimen not taken correctly.	3	6.8	4	9.8
Specimen was scarified between layers.	4	9.1	3	7.3
Method B - Aggregate added before soil and cement were mixed.	1	2.3	1	2.4
Complete set of sieves not presented.	4	9.1	5	12.2
Moisture content containers did not have close-fitting lids.	1	2.3	0	NA
Split wall mold not compared.	1	2.3	0	NA
Sample not dried before testing.	1	2.3	1	2.4
Total number of footnotes for test	44		41	
Percentage of the total number footnotes (AASHTO or ASTM)	1.3		1.0	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
WETTING-AND-DRYING OF SOIL-CEMENT MIXTURES (T135/D559)				
Mold did not meet specifications.	4	12.5	2	6.1
Hand rammer did not meet specifications.	3	9.4	4	12.1
Straightedge did not meet specifications.	2	6.3	2	6.1

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Oven did not maintain temperature of 110ºC.	0	NA	0	NA
Butcher knife not presented.	1	3.1	1	3.0
Wire scratch brush not presented.	1	3.1	1	3.0
Wire scratch brush did not meet specifications.	5	15.6	5	15.2
Six-prong ice pick or similar apparatus not presented.	7	21.9	9	27.3
Covered containers not capable of maintaining temperature of 21ºC.	2	6.3	2	6.1
Sample not separated on No. 4 sieve.	0	NA	0	NA
Layers scarified incorrectly.	0	NA	0	NA
Moisture specimen not taken.	0	NA	0	NA
Specimens not identified as No. 1 and No. 2.	0	NA	0	NA
Dimensions and volume of specimen No. 1 not determined.	0	NA	0	NA
Material not compacted correctly.	1	3.1	1	3.0
Complete set of sieves not presented.	3	9.4	4	12.1
Not placed in the oven for 42 hours.	1	3.1	1	3.0
Moisture content containers did not have close-fitting lids.	1	3.1	0	NA
Specimens not submerged after removal from moist room.	1	3.1	1	3.0
Total number of footnotes for test	32		33	
Percentage of the total number footnotes (AASHTO or ASTM)	0.9		0.8	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
FREEZING-AND-THAWING OF SOIL-CEMENT MIXTURES (T136/D560)				
Mold did not meet specifications.	3	13.0	2	9.5
Mechanical rammer not calibrated.	0	NA	0	NA
Straightedge did not meet specifications.	2	8.7	1	4.8
Butcher knife not presented.	0	NA	0	NA
Wire scratch brush not presented.	0	NA	0	NA
Wire scratch brush did not meet specifications.	2	8.7	2	9.5
Six-prong ice pick or similar apparatus not presented.	8	34.8	8	38.1
Temperature of freezing cabinet not less than or equal to 23ºC.	1	4.3	2	9.5

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Absorptive pads not presented.	4	17.4	4	19.0
Procedure not demonstrated.	0	NA	0	NA
Complete set of sieves not presented.	1	4.3	1	4.8
Moisture content containers did not have close-fitting lids.	1	4.3	0	NA
Hand rammer presented did not conform.	1	4.3	1	4.8
Total number of footnotes for test	23		21	
Percentage of the total number footnotes (AASHTO or ASTM)	0.7		0.5	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
WET PREPARATION OF SOILS (T146/D2217)				
Pestle not rubber-covered.	1	6.7	2	8.7
Buchner funnel did not meet specifications.	0	NA	0	NA
Pans 12 in. in diameter by 3 in. deep not presented.	2	13.3	4	17.4
Specimen not dried at temperature of 60ºC or less.	0	NA	0	NA
Sample for Procedure B not shipped from field to laboratory.	0	NA	0	NA
Sample not separated on No. 10 or No. 40 sieves.	0	NA	0	NA
+No. 10 or +No. 40 material not soaked.	2	13.3	0	NA
Water level not approximately not approximately ½ in. above sieve mesh.	0	NA	1	4.3
No. 10 or No. 40 sieve not placed on bottom of a clean pan.	0	NA	2	8.7
Washed material not transferred from sieve to pan before adding another increment.	1	6.7	2	8.7
Washed material not rinsed with clean water prior to transferring to pan.	2	13.3	2	8.7
Oven did not maintain temperature of 110ºC.	3	20.0	3	13.0
Washed material not dried and resieved	4	26.7	4	17.4
Mortar and pestle were not presented.	0	NA	3	13.0
Total number of footnotes for test	15		23	
Percentage of the total number footnotes (AASHTO or ASTM)	0.4		0.5	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
SAND EQUIVALENT (T176/D2419)				
Mechanical shaker not presented.	50	21.6	1	0.5
Mechanical shaker not one of the designs specified.	1	0.4	1	0.5
Mechanical shaker not fastened to counter.	9	3.9	11	6.0
Mechanical shaker did not have counter.	0	NA	0	NA
Counter on manual shaker not operating.	1	0.4	0	NA
Working solution not 36 in. above work surface.	21	9.1	22	12.1
Work surface not free of vibration.	0	NA	0	NA
Work surface exposed to direct sunlight.	0	NA	0	NA
Pinched of irrigator tube did not conform to specifications.	9	3.9	9	4.9
Temperature of solution did not meet specifications.	12	5.2	17	9.3
Weighted foot mass did not meet specifications.	5	2.2	7	3.8
Graduated cylinder did not meet specifications.	2	0.9	1	0.5
Funnel mouth diameter not 4 in.	1	0.4	0	NA
Solution not free of fungus.	1	0.4	1	0.5
Cylinder was cracked.	0	NA	0	NA
Bottom of cylinder not tapped with hand to release air bubbles.	19	8.2	23	12.6
Irrigation procedure performed before mechanical shaking procedure.	0	NA	0	NA
Material clinging to cylinder walls not rinsed down.	1	0.4	2	1.1
Bottom of tin not tapped on hard surface while filling.	18	7.8	6	3.3
After splitting or quartering, specimen not oven-dried prior to testing.	1	0.4	2	1.1
Wetted specimens not allowed to stand for 10 minutes.	0	NA	1	0.5
Referee Method - material not oven-dried prior to testing.	0	NA	1	0.5
Specimens not dried to constant mass prior to testing.	5	2.2	6	3.3
Liquid level not 15 in. after removing irrigation tube.	7	3.0	4	2.2
All fines not removed from +No. 4 material.	7	3.0	6	3.3
Hand shaking procedure incorrect.	4	1.7	6	3.3
Cylinder not placed in upright position after shaking.	0	NA	0	NA
Initial sample not split or quartered to yield four 3-oz. tins of material.	8	3.4	12	6.6
Pre-wet Method - sample not mixed on splitting cloth.	2	0.9	0	NA

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Pre-wet Method - sample not mixed in pan with trowel and formed into a cone.	1	0.4	1	0.5
Higher graduation mark not recorded when readings fall between lines.	4	1.7	2	1.1
Sand reading determined incorrectly.	2	0.9	2	1.1
Tin not pushed through base of pile.	0	NA	0	NA
Tins not struck off level using trowel.	0	NA	1	0.5
Incorrect sample mass.	0	NA	1	0.5
Oven did not maintain temperature of 110°C.	3	1.3	4	2.2
Manual shaker did not conform to design specifications.	1	0.4	2	1.1
Solution more than 30 days old.	4	1.7	0	NA
Solution more than 2 weeks old.	0	NA	8	4.4
Cylinder and contents not shaken hand for 45 seconds.	8	3.4	9	4.9
Working solution not added to 4 inch mark before adding material.	3	1.3	3	1.6
Stock calcium chloride did not contain formaldehyde.	7	3.0	2	1.1
Clay reading determined incorrectly.	3	1.3	2	1.1
Quartering or splitting cloth not presented.	4	1.7	0	NA
Tin measure did not conform to specifications.	3	1.3	1	0.5
Clock not readable to seconds.	1	0.4	2	1.1
Hand shake throw was not 9 ± 1 in.	0	NA	1	0.5
Material was not loosened before shaking.	1	0.4	0	NA
Irrigator tube not forced into the material with a twisting motion.	1	0.4	1	0.5
Air Dry Method - Sample preparation incorrect.	2	0.9	1	0.5
Total number of footnotes for test	232		182	
Percentage of the total number footnotes (AASHTO or ASTM)	6.8		4.3	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
R-VALUE (T190/D2844)				
Expansion pressure calibration equipment not presented or not calibrated.	4	2.9	4	2.8
Expansion pressure calibration equipment did not include a weight.	0	NA	0	NA
Tamper shoe worn.	14	10.2	11	7.6
Creped filter paper not presented or not used.	16	11.7	14	9.7
Smooth filter paper not presented.	3	2.2	3	2.1
Mold did not meet specifications.	5	3.6	6	4.1
Metal follower did not meet specifications.	5	3.6	8	5.5
Tamping rod not presented.	1	0.7	1	0.7
Diameter of tamping rod not 1.5 in.	6	4.4	8	5.5
Mold holder did not rotate.	0	NA	0	NA
Thickness of rubber disk not 1/8 in.	3	2.2	3	2.1
Dwell time of kneading compactor not 0.15 to 0.45 seconds.	0	NA	0	NA
Rubber disk not cemented to base of mold holder.	18	13.1	21	14.5
Compactor not equipped with trough.	1	0.7	2	1.4
Exudation device not presented.	0	NA	0	NA
Stabilometer not calibrated.	0	NA	0	NA
Soil not fed into mold in 20 equal increments.	9	6.6	11	7.6
Three inches of soil not fed into mold.	12	8.8	11	7.6
Mold not positioned with 1/8 in. clearance between mold and base of holder.	6	4.4	8	5.5
Creped filter paper not placed on turntable of expansion pressure device.	1	0.7	2	1.4
Load not applied at uniform rate of 2000 lb/min.	4	2.9	5	3.4
Soil surface not leveled with 1.5-in. diameter tamping rod.	2	1.5	2	1.4
Shims not removed before 100 additional tamps.	1	0.7	0	NA
After 20 equal increments, 10 additional tamps not applied.	3	2.2	4	2.8
Load varied from 2000 lbs during testing.	1	0.7	1	0.7
Load not applied at uniform rate of 0.05 in./min.	2	1.5	1	0.7
Specimen not rebounded in covered mold.	3	2.2	4	2.8
Filter paper not placed in mold before adding soil.	0	NA	0	NA
Procedure not demonstrated.	0	NA	0	NA

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Incorrect pressure for 100 additional tamps.	2	1.5	3	2.1
Vertical load not reduced correctly for stabilometer reading.	1	0.7	1	0.7
Standard metal specimen did not conform to specifications.	2	1.5	2	1.4
Specimen not extruded into stabilometer.	1	0.7	1	0.7
Oven did not maintain temperature of 110°C.	0	NA	0	NA
As increments of soil are fed into the mold, the tamping pressure was not 250 psi.	1	0.7	1	0.7
Stabilometer not presented.	0	NA	1	0.7
Mixed samples not allowed to stand overnight.	1	0.7	0	NA
A deflection gage was not presented.	2	1.5	1	0.7
100 additional tamps were not applied.	1	0.7	1	0.7
Phosphur bronze disc did not meet spec.	2	1.5	0	NA
Expansion pressure not determined.	1	0.7	1	0.7
Incorrect sample mass.	1	0.7	1	0.7
Specimen not inverted for water exudation testing.	1	0.7	1	0.7
Specimen not mixed with correct amount of water.	1	0.7	1	0.7
Total number of footnotes for test	137		145	
Percentage of the total number footnotes (AASHTO or ASTM)	4.0		3.4	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
CALIFORNIA BEARING RATIO (T193/D1883)				
Spacer disk did not meet specifications.	8	3.4	15	4.3
Tripod for dial indicator not presented.	2	0.9	2	0.6
Tripod not arrange to fit mold extension collar.	2	0.9	1	0.3
Mold did not meet specifications.	5	2.2	8	2.3
Mold did not have extension collar.	0	NA	0	NA
Base plate did not meet specifications.	6	2.6	8	2.3
Mechanical rammer did not meet specifications.	2	0.9	4	1.1
Mechanical rammer not calibrated.	0	NA	1	0.3
Hand rammer did not meet specifications.	17	7.3	30	8.5
Surcharge weights not presented.	5	2.2	8	2.3
Surcharge weights did not meet specifications.	9	3.9	14	4.0
Perforated base plate did not meet specifications.	1	0.4	1	0.3
Moisture content containers did not have close-fitting lids.	3	1.3	1	0.3
Straightedge did not meet specifications.	0	NA	0	NA
Two dial gages not presented.	3	1.3	3	0.9
Penetration piston did not meet specifications.	7	3.0	11	3.1
2-in. sieve not presented.	0	NA	2	0.6
Loading device not capable of applying loads up to 10,000 lbs.	6	2.6	14	4.0
Loading device not equipped with load indicating device readable to 10 lbf.	1	0.4	5	1.4
Oven did not maintain temperature of 110ºC.	2	0.9	2	0.6
Moisture content specimens not taken at beginning and end of compaction.	17	7.3	20	5.7
Load not applied at uniformed rate of 0.05 in./min.	8	3.4	10	2.8
Penetration piston not seated after one surcharge weight placed on specimen.	31	13.4	40	11.4
Penetration piston not seated with 10-lb load.	8	3.4	11	3.1
Surcharge weights, filter paper and perforated plate not removed after draining.	8	3.4	8	2.3
Tripod with indicator attached not placed on top of mold for initial reading.	0	NA	0	NA
Mold did not have free access of water during soaking.	15	6.5	21	6.0
Mass of mold not determined with base plate and collar attached.	3	1.3	1	0.3
Loads not recorded at specified penetrations.	1	0.4	4	1.1

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Mold, base plate and collar not weighed to 0.01 lb prior to compaction.	4	1.7	0	NA
Extension collar not attached to mold prior to weighing.	1	0.4	1	0.3
Spacer disk not used during compaction.	0	NA	0	NA
Filter paper not placed on perforated base plate after compaction.	0	NA	0	NA
Specimen not allowed to drain downward for 15 minutes.	14	6.0	15	4.3
Mass of mold and contents not determined after compaction.	3	1.3	4	1.1
Mass of specimen not determined before soaking.	0	NA	0	NA
Mass of specimen not determined prior to penetration.	1	0.4	8	2.3
Additional material not added to mold during compaction of third layer.	0	NA	0	NA
Percent swell not determined.	4	1.7	6	1.7
Filter paper not placed on top of spacer disk prior to compaction.	4	1.7	5	1.4
Incorrect moisture content specimen mass.	0	NA	1	0.3
Surcharge weights and perforated base plate not removed after draining.	4	1.7	5	1.4
Surcharge weights placed on specimen not equal to those used during soaking.	3	1.3	3	0.9
Swell plate not used during soaking.	0	NA	0	NA
Filter paper not removed from specimen prior to penetration.	0	NA	1	0.3
Specimen not compacted in 5 layers according to D1557.	0	NA	0	NA
Strain gage not attached to load measuring device.	1	0.4	17	4.8
Control compaction test not performed using 6-in. mold.	0	NA	0	NA
Base plate removed during penetration (loss of specimen).	0	NA	0	NA
Specimen not compacted with circular foot.	1	0.4	5	1.4
Final moisture content not taken from top 1-in. of specimen.	3	1.3	3	0.9
Procedure not demonstrated.	3	1.3	3	0.9
Improper sample preparation.	2	0.9	3	0.9
Mass not determined after soaking.	0	NA	2	0.6
Swell plate did not meet specifications.	3	1.3	5	1.4
Depth of penetration was not checked with a ruler.	0	NA	4	1.1
Proving ring not presented.	0	NA	1	0.3
Incorrect sample mass.	1	0.4	1	0.3
Test not rerun when 0.02 > 0.01.	4	1.7	6	1.7

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Soil layers not lightly tamped with rammer or 2-in. diameter cylinder.	0	NA	1	0.3
Filter paper not presented.	1	0.4	1	0.3
Strain gage was attached to the support legs.	0	NA	1	0.3
Incorrect surcharge weights used during soaking.	1	0.4	1	0.3
Minus 3/4 inch material was not used.	0	NA	1	0.3
Dial indicator did not meet specifications.	1	0.4	0	NA
Final swell reading not taken as specified.	3	1.3	3	0.9
Total number of footnotes for test	232		335	
Percentage of the total number footnotes (AASHTO or ASTM)	6.8		2.5	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
UNCONFINED COMPRESSIVE STRENGTH (T208/D2166)				
Deformation indicator did not have correct travel range.	10	18.9	16	20.3
Moisture content containers with close-fitting lids not presented.	3	5.7	2	2.5
Specimen measuring device did not have specified accuracy.	4	7.5	4	5.1
Height-to-diameter ratio incorrect.	6	11.3	7	8.9
Moisture content not determined using representative cuttings or entire sample.	0	NA	0	NA
Time values not recorded during loading.	7	13.2	11	13.9
Specimen dimensions measured incorrectly.	9	17.0	13	16.5
Loading rate incorrect.	2	3.8	4	5.1
Loading not continued until 15% strain reached.	0	NA	2	2.5
Sketch or photograph of specimen failure not obtained.	2	3.8	3	3.8
Voids in undisturbed specimens not filled with trimmings.	1	1.9	1	1.3
Initial specimen mass not determined.	1	1.9	1	1.3
Procedure not demonstrated.	0	NA	0	NA
Oven did not maintain temperature of 110ºC.	1	1.9	4	5.1
Specimen diameter not determined correctly.	2	3.8	3	3.8
Sample extruder not presented.	1	1.9	3	3.8
Load, deformation, and time values not recorded to define curve.	0	NA	2	2.5
Height determined incorrectly.	3	5.7	2	2.5
Sample not extruded at a uniform rate.	1	1.9	1	1.3
Total number of footnotes for test	53		79	
Percentage of the total number footnotes (AASHTO or ASTM)	1.6		1.9	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
PERMEABILITY OF GRANULAR SOILS (T215/D2434)				
Permeameter did not meet specifications.	2	4.3	4	7.1
Vacuum pump or water aspirator not presented.	1	2.2	1	1.8
Spring not attached to top porous disk or screen.	2	4.3	3	5.4
Large funnels not presented.	6	13.0	8	14.3
Funnel spout length did not meet specifications.	3	6.5	4	7.1
Manometer tubes not equipped with metric scales.	0	NA	0	NA
Distance between manometer outlets not equal to permeameter diameter.	1	2.2	1	1.8
Scoop did not have correct capacity.	0	NA	1	1.8
Constant head filter tank not equipped with fine screen.	4	8.7	3	5.4
250-mL graduate not presented.	1	2.2	2	3.6
Sample not air-dried granular soil.	1	2.2	1	1.8
Sieve analysis not performed, +3/4-in. particles contained in sample.	1	2.2	1	1.8
Specimen not compacted to 20 mm above upper manometer outlet.	1	2.2	1	1.8
Mass of uncompacted material not determined.	0	NA	0	NA
Air not evacuated from specimen by applying a vacuum.	4	8.7	4	7.1
Specimen not saturated from bottom upwards with a vacuum.	2	4.3	2	3.6
Tests not repeated at heads increasing by 5 mm.	1	2.2	2	3.6
Permeability flow system not free of air.	0	NA	0	NA
Funnel not used to add soil into permeameter chamber.	3	6.5	4	7.1
Soil remaining in pan not remixed after each successive layer.	3	6.5	3	5.4
Layers not compacted by one of the specified procedures.	2	4.3	2	3.6
Specimen height determined incorrectly.	0	NA	1	1.8
Head not determined by using manometer tubes.	1	2.2	1	1.8
Permeability not corrected to 20 degrees C.	2	4.3	2	3.6
Specimen compaction equipment not presented.	0	NA	1	1.8
Description of water type not recorded.	1	2.2	1	1.8
Temperature not recorded during testing.	1	2.2	1	1.8
Improper sample preparation.	2	4.3	1	1.8
Stable constant head not obtained before beginning the test.	1	2.2	1	1.8
Total number of footnotes for test	46		56	
Percentage of the total number footnotes (AASHTO or ASTM)	1.3		1.3	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
ONE-DIMENSIONAL CONSOLIDATION (T216/D2435)				
Consolidometer not calibrated.	29	15.8	41	16.6
Calibration disk did not meet specifications.	10	5.5	15	6.1
Calibration disk not presented.	32	17.5	40	16.2
Porous stones in unsatisfactory condition.	6	3.3	6	2.4
Porous stones not cleaned and boiled after each use.	4	2.2	7	2.8
Moisture content containers with close-fitting lids not presented.	4	2.2	6	2.4
Wire saw not presented.	1	0.5	1	0.4
Inside diameter of ring not determined to correct accuracy.	9	4.9	9	3.6
Height-to-diameter ratio incorrect.	10	5.5	16	16.5
Normal displacement versus log time not plotted.	5	2.7	7	2.8
Initial height not determined correctly.	48	26.2	56	22.7
Loading method did not permit quick application of load increments.	1	0.5	1	0.4
Specimen not inundated after first load increment applied.	4	2.2	5	2.0
Seating load not applied to specimen.	1	0.5	6	2.4
Specimen not removed from consolidation ring and weighed.	0	NA	1	0.4
Initial specimen volume not determined.	2	1.1	3	1.2
Porous stones not moistened prior to use.	0	NA	0	NA
Final wet specimen mass not determined according to T265.	5	2.7	6	2.4
Incorrect specimen diameter.	1	0.5	1	0.4
Specimen not allowed to consolidate 24 hours under desired load.	0	NA	0	NA
Diameter of the top disk does not meet specifications.	1	0.5	2	0.8
Oven did not maintain temperature of 110°C.	1	0.5	3	1.2
Specimen ring made of corrosive material.	1	0.5	1	0.4
Deformation indicator presented was not readable to 0.0001 in.	3	1.6	5	2.0
Balance not readable to 0.01 g.	0	NA	2	0.8
Deformation readings not taken while shearing.	0	NA	2	0.8
Water content not determined from trimmings.	1	0.5	2	0.8
Seating pressure not 100 lb/ft^2	3	1.6	2	0.8
Procedure not demostrated.	1	0.5	1	0.4
Total number of footnotes for test	183		247	
Percentage of the total number footnotes (AASHTO or ASTM)	5.4		5.8	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
DIRECT SHEAR (T236/D3080)				
Weight of top shear box more than 1% of applied normal force.			33	19.1
Shear device not calibrated and/or calibration disk not presented.	24	30.4	36	20.8
Calibration disk did not meet specifications or not presented.	9	11.4	12	6.9
Loading device did not permit adjustment of displacement rate.	0	NA	0	NA
Displacement indicator did not have correct sensitivity or not presented.	8	10.1	13	7.5
Moisture content containers did not have close-fitting lids.	4	5.1	4	2.3
Screws not available to control gap between top and bottom frames.	0	NA	0	NA
Shear device not capable of specified displacement rates.	0	NA	4	2.3
Straightedge or wire saw not presented.	1	1.3	1	0.3
Porous stones in unsatisfactory condition.	5	6.3	12	6.9
Normal force not of specified accuracy.	1	1.3	1	0.6
Normal displacement vs. time readings not taken or not plotted.	11	13.9	13	7.5
Specimen failure surface not photographed/sketched/described.	0	NA	3	1.7
Specimen not consolidated or consolidated incorrectly.	2	2.5	2	1.2
Final oven-dry mass not determined.	1	1.3	1	0.6
Incorrect specimen diameter.	1	1.3	0	NA
Horizontal displacement not measured to specified accuracy.	0	NA	0	NA
Gap distance between top and bottom frames incorrect prior to shearing.	0	NA	1	0.6
Vertical displacement or time readings not recorded.	0	NA	3	1.7
Correct time to failure or shear rate not determined.	3	3.8	2	1.2
Specimen not inundated after applying normal force.	2	2.5	1	0.6
Deformation readings not recorded.	3	3.8	3	1.7
Shear box halves not pulled apart along shear plane.	0	NA	6	3.5
Sketch or photograph of specimen failure not obtained.	1	1.3	9	5.2
Oven did not maintain temperature of 110°C.	1	1.3	1	0.6
During shearing, 10% of specimen diameter not reached.	1	1.3	0	NA
Proving ring not readable.	0	NA	2	1.2
During consolidation, horizontal load and displacement readings were not recorded.	0	NA	1	0.6
Balance not readable to 0.01 g.	0	NA	1	0.6

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Specimen not compacted correctly.	0	NA	2	1.2
Calculations and graph not done correctly.	0	NA	1	0.6
Water content not determined according to T265/D2216.	0	NA	1	0.6
Improper sample preparation.	1	1.3	1	0.6
Normal force and time readings not recorded during shearing.	0	NA	3	1.7
Total number of footnotes for test	79		173	
Percentage of the total number footnotes (AASHTO or ASTM)	2.3		4.1	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
DENSITY OF SOIL BY NUCLEAR METHODS (T238/D2922)				
Standard count not determined correctly.	5	20.8	3	14.3
One 4 minute reading.	13	54.2	3	14.3
No drive pin extractor.	0	NA	1	4.8
Calibration curves not verified once every 12 months.	1	4.2	8	38.1
Backscatter Method - One or more 1 minute readings not obtained.	1	4.2	0	NA
Gage not capable of performing at all depths between 2 and 12 inches.	1	4.2	0	NA
Calibration records not presented.	2	8.3	3	14.3
Area covered by filler material greater than 10%.	1	4.2	1	4.8
The drive pin was bent.	0	NA	1	4.8
Direct Transmission Method - Corners of guide not marked.	0	NA	1	4.8
Total number of footnotes for test	24		21	
Percentage of the total number footnotes (AASHTO or ASTM)	0.7		0.5	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
MOISTURE CONTENT OF SOILS BY NUCLEAR METHODS (T239/D3017)				
Standard count not determined correctly.	5	20.8	2	10.0
One 4 minute reading.	14	58.3	3	15.0
Calibration curves not verified once every 12 months.	1	4.2	11	55.0
Backscatter Method - One or more 1 minute readings not obtained.	1	4.2	0	NA
Calibration records not presented.	2	8.3	3	15.0
Area covered by filler material greater than 10%.	1	4.2	1	5.0
Total number of footnotes for test	24		20	
Percentage of the total number footnotes (AASHTO or ASTM)	0.7		0.5	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
MOISTURE CONTENT OF SOILS (T265/D2216)				
Moisture content containers did not have close-fitting lids.	18	64.3	16	36.4
Moisture content containers not resistant to corrosion.	0	NA	0	NA
Balance readable to 0.01 g for sample masses less than 200 g not presented.	1	3.6	7	15.9
Desiccator not presented.	0	NA	3	6.8
Desiccator did not contain desiccant.	0	NA	1	2.3
Oven did not maintain temperature of 110ºC.	6	21.4	8	18.2
Containers not covered during cooling.	2	7.1	4	9.1
Samples not stored at correct temperature.	0	NA	0	NA
Samples having masses less than 200 g not weighed to 0.01 g.	0	NA	1	2.3
Container lid not removed prior to placing specimen in oven.	1	3.6	3	6.8
Mass of container, including lid, not determined.	0	NA	0	NA
Specimen obtained incorrectly.	0	NA	0	NA
Specimen lid not replaced after drying.	0	NA	1	2.3
Total number of footnotes for test	28		44	
Percentage of the total number footnotes (AASHTO or ASTM)	0.8		1.0	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
UNCONSOLIDATED, UNDRAINED TRIAXIAL COMPRESSION (T296/D2850)				
Pore pressure gage did not have correct readability.	1	2.5	1	2.0
Pore-water pressure device not presented.	0	NA	0	NA
Chamber pressure gage did not have correct readability.	6	15.0	6	11.8
Axial loading device not operating properly.	1	2.5	0	NA
Incorrect specimen measurement device.	3	7.5	5	9.8
Plastic specimen end caps damaged.	2	5.0	2	3.9
Trimmings not used for moisture content.	1	2.5	1	2.0
Specimen failure mode not sketched or photographed.	1	2.5	1	2.0
Load piston not in contact with cap prior to filling chamber.	1	2.5	2	3.9
Specimen dimensions determined incorrectly.	0	NA	0	NA
Drainage lines not filled with deaired water for wet mounting method.	0	NA	0	NA
Porous discs not saturated.	1	2.5	2	3.9
Axial load piston not seated or aligned.	1	2.5	3	5.9
Deformation readings not taken at specified intervals.	5	12.5	6	11.8
Soil not extruded in same direction that it entered tube.	0	NA	0	NA
Sketch or photograph of specimen failure not obtained.	1	2.5	2	3.9
Loading not stopped at 15% strain.	1	2.5	1	2.0
Specimen cap and base not impermeable.	6	15.0	10	19.6
Height-to-diameter ratio incorrect.	1	2.5	1	2.0
Material not scarified between layers.	1	2.5	1	2.0
Procedure not demonstrated.	1	2.5	0	NA
Deformation indicator not readable to 0.02% of specimen height.	0	NA	1	2.0
Deformation indicator did not have the correct travel range.	3	7.5	2	3.9
Weight of cap did not conform.	1	2.5	0	NA
Vacuum system was in unsatisfactory condition.	1	2.5	1	2.0
Load and deformation readings were not taken at increments of 0.1 to 0.5% of strain.	0	NA	1	2.0
Test not started with piston slightly above cap.	0	NA	1	2.0
Chamber not filled with a confining liquid.	1	2.5	1	2.0
Total number of footnotes for test	40		51	
Percentage of the total number footnotes (AASHTO or ASTM)	1.2		1.2	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
CONSOLIDATED, UNDRAINED TRIAXIAL COMPRESSION (T297/D4767)				
Vacuum gage did not have correct readability.	2	3.9	2	4.0
Pressure and vacuum gages did not have correct readability.	7	13.7	7	14.0
Proper trimming tools not presented.	0	NA	0	NA
Axial loading device not operating properly.	0	NA	0	NA
Deformation readings not taken or not plotted.	9	17.6	9	18.0
Piston not locked above cap during consolidation.	2	3.9	2	4.0
Burette readings not recorded or not plotted.	2	3.9	2	4.0
Specimen dimensions not measured to specified accuracy.	3	5.9	3	6.0
Porous disks not oven-dried for dry mounting method.	1	2.0	1	2.0
Sketch or photograph of specimen failure not obtained.	2	3.9	2	4.0
Weight of top end cap did not meet specifications.	4	7.8	1	2.0
During, prep water content not taken from trimmings.	1	2.0	1	2.0
Pore water pressure could not be determined.	1	2.0	1	2.0
Control panel was unsatisfactory.	1	2.0	1	2.0
Chamber and water lines not water tight.	1	2.0	1	2.0
Specimen dimensions determined incorrectly.	0	NA	1	2.0
Porous stones not boiled after use.	5	9.8	8	16.0
Height-to-diameter ratio incorrect.	2	3.9	3	6.0
Material not scarified between layers.	1	2.0	1	2.0
Procedure not demonstrated.	1	2.0	0	NA
Deformation not readable to 0.02% of the specimen height.	0	NA	1	2.0
Water deairation device not presented.	1	2.0	1	2.0
Incorrect specimen device.	1	2.0	0	NA
Pore-water pressure valves read incorrectly.	1	2.0	0	NA
Deformation indicator did not have correct travel range.	2	3.9	1	2.0
Vacuum presented was in unsatisfactory condition.	1	2.0	1	2.0
Total number of footnotes for test	51		50	
Percentage of the total number footnotes (AASHTO or ASTM)	1.5		1.2	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
MATERIAL IN SOILS FINER THAN NO. 200 SIEVE (D1140)				
Wetting agent presented or used did not meet specifications.			2	2.5
Oven did not maintain temperature of 110ºC.			0	NA
Entire specimen not washed on sieve nest.			25	31.3
Dispersing agent not used during soaking for Method B.			3	3.8
Specimen not agitated during soaking.			1	1.3
Protective sieve not used.			34	42.5
Water overflowed No. 200 sieve during washing.			7	8.8
Downward pressure exerted during wash.			1	1.3
Method B - Soaking time not long enough.			1	1.3
Percentage of material passing the No. 200 sieve not calculated correctly.			1	1.3
Balance not readable to 0.01 g.			2	2.5
Sample not oven-dried.			2	2.5
Sample not washed until water was clear.			1	1.3
Total number of footnotes for test			80	
Percentage of the total number footnotes (AASHTO or ASTM)			1.9	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
CLASSIFICATION OF SOILS (D2487)				
None			0	NA

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
DESCRIPTION AND IDENTIFICATION OF SOILS (D2488)				
None			0	NA

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
HYDRAULIC CONDUCTIVITY (FLEXIBLE WALL PERMEABILITY) (D5084)				
Moisture content containers did not have close-fitting lids.			4	12.1
Initial specimen mass not determined.			1	3.0
Membrane expander not used for membrane or O-rings.			0	NA
Final specimen dimensions not measured and/or recorded after permeation.			2	6.1
Final moisture content not determined.			0	NA
Specimen dimensions not determined to correct accuracy.			0	NA
Specimen coated with wax before testing.			0	NA
During permeation effluent pressure decreased.			1	3.0
After compaction ends of specimen not scarified.			1	3.0
Temperature not measured periodically.			4	12.1
Hydraulic conductivity not based at 20 degrees C.			1	3.0
Specimen dimensions measured incorrectly.			1	3.0
Consolidaton not performed.			1	3.0
Rubber O-rings presented did not meet specifications.			1	3.0
Specimen cap and base in unsatisfactory condition.			1	3.0
Oven did not maintain 110^{oC}			2	6.1
End caps not coated with grease.			2	6.1
Flexible membranes did not meet specifications.			1	3.0
Water content not taken from trimmings.			1	3.0
Small confining pressure not applied prior to saturation.			1	3.0
Porous stones not soaked prior to use.			1	3.0
Amount of water outflow not recorded.			2	6.1
Incorrect balance.			1	3.0
Vacuum system presented was in unsatisfactory condition.			1	3.0
Improper sample preparation.424242			1	3.0
Each layer not scarified.			1	3.0
Filter paper not soaked in impermeant water.			1	3.0
Total number of footnotes for test			33	
Percentage of the total number footnotes (AASHTO or ASTM)			0.8	

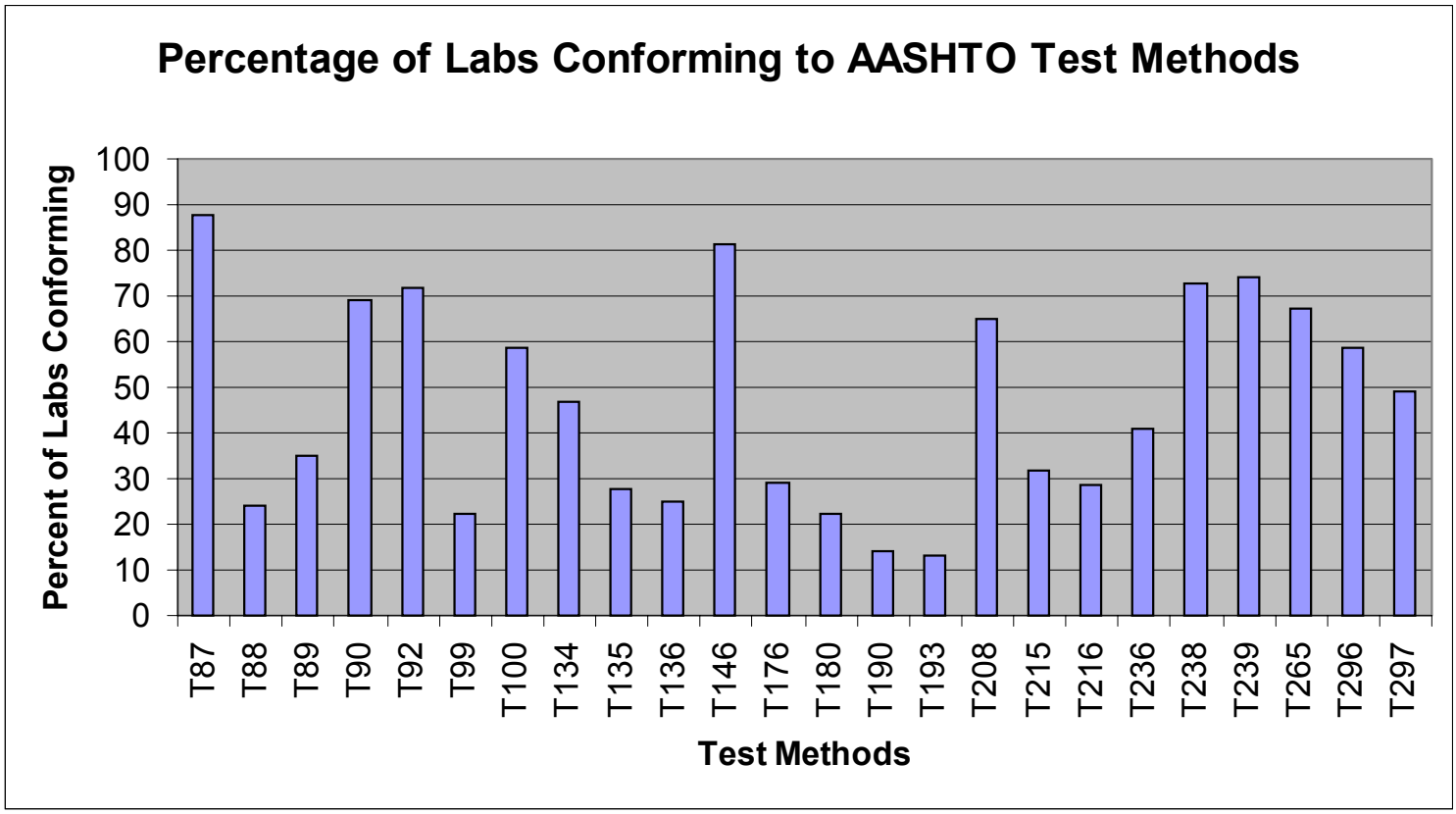

Figure 1: Percentage of Labs Conforming to AASHTO Test Methods

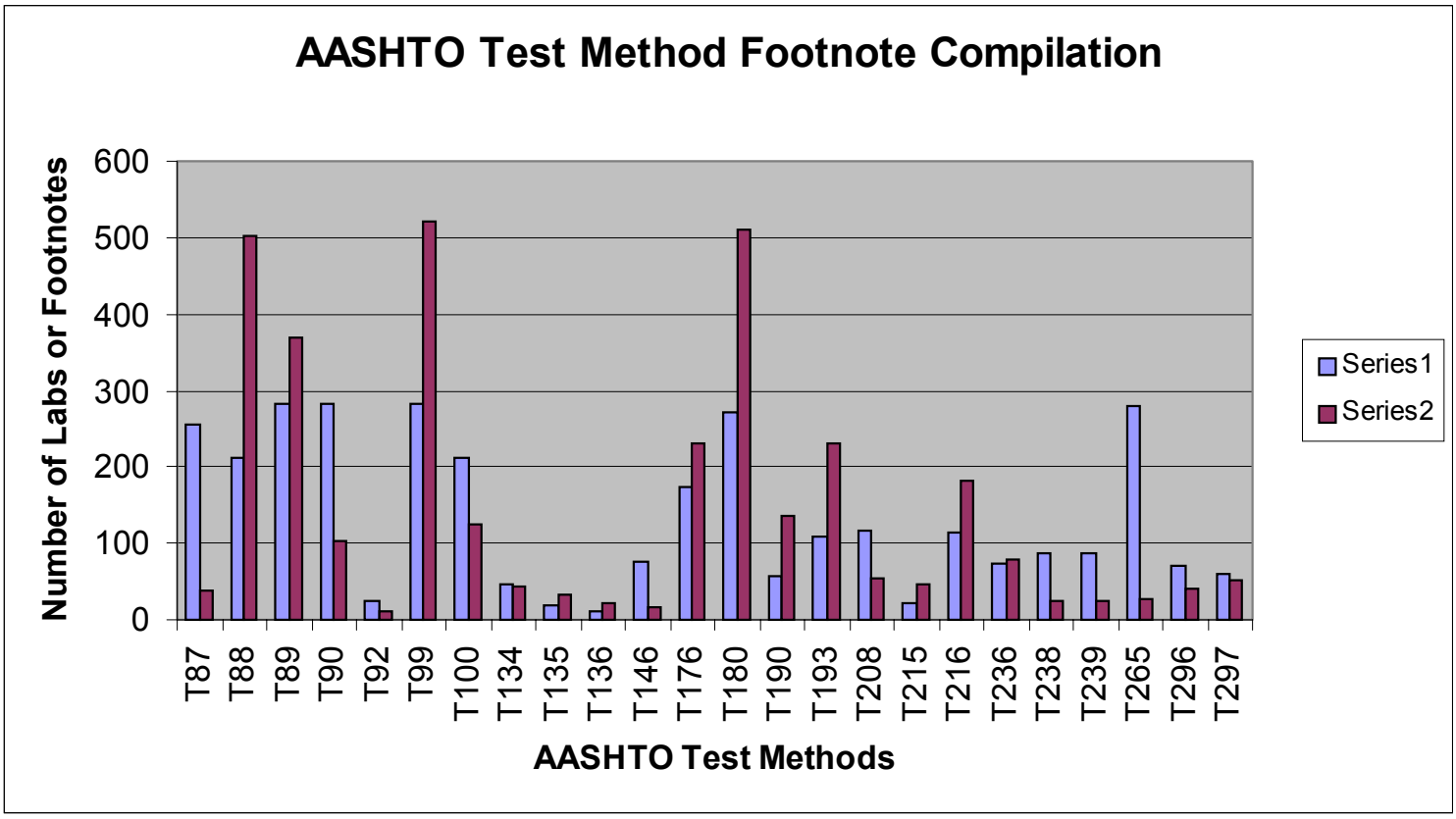

Figure 2: Series 1 - Number of Labs Performing the Test Method
Series 2 - Number of Footnotes for Each Test Method

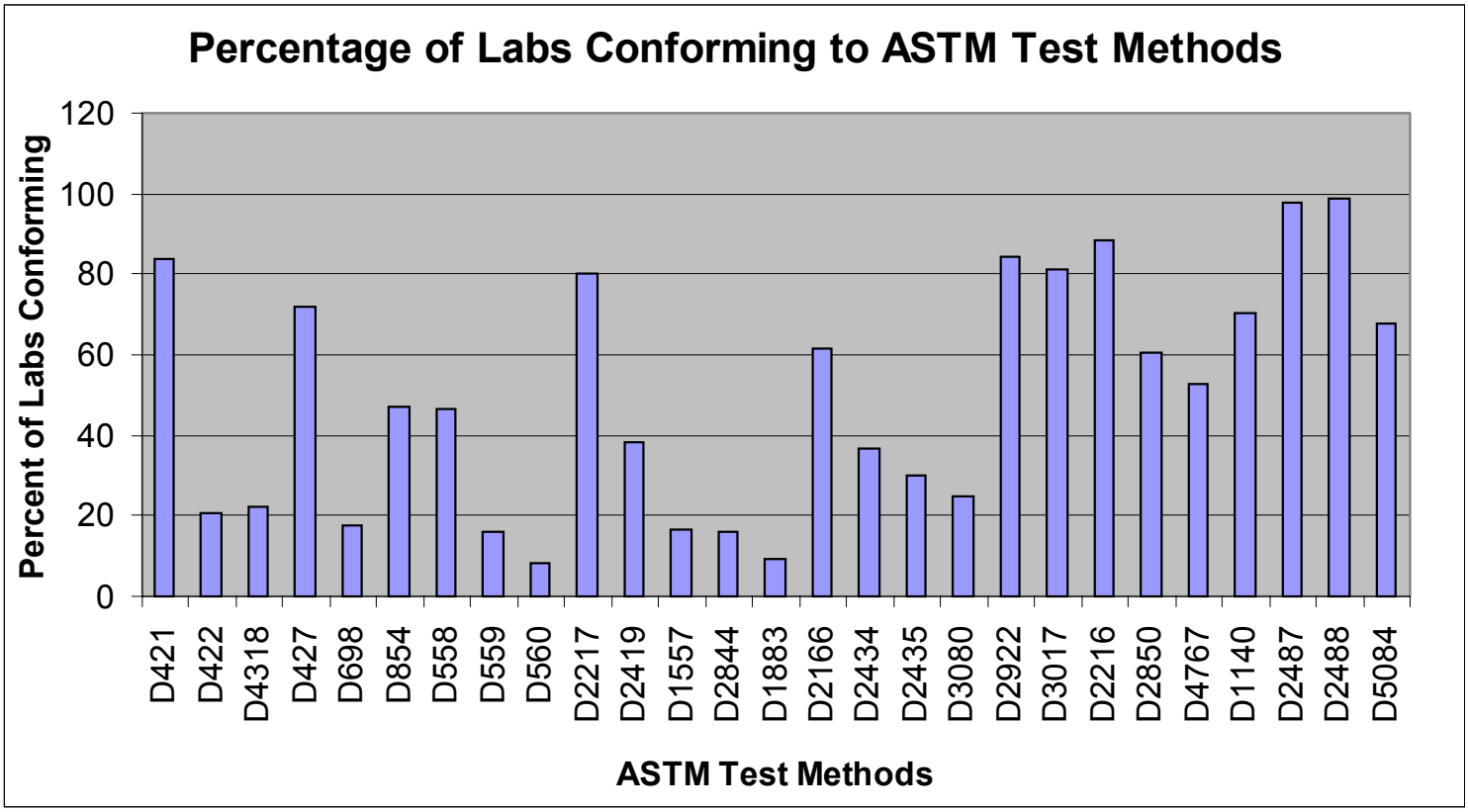

Figure 3: Percentage of Labs Conforming to ASTM Test Method

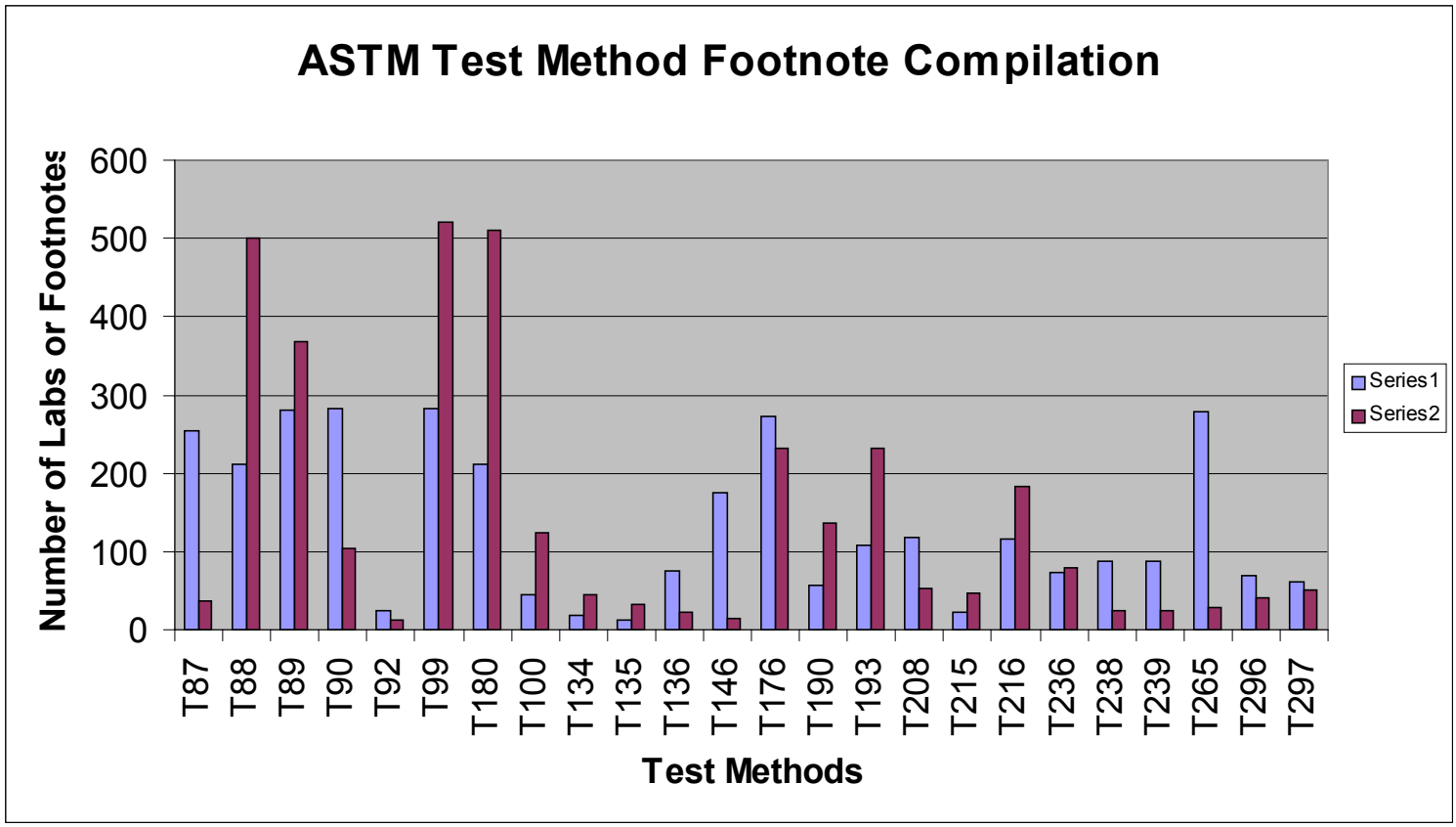

Figure 4: Series 1 - Number of Labs Performing the Test Method
Series 2 - Number of Footnotes for Each Test Mehod